

# Thermal Overload Relays

## TR series

### ■ Features

#### ● Manual trip

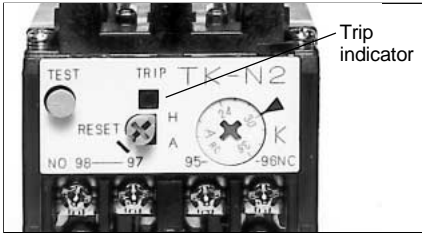
These relays can be manually tripped for sequence inspection by pressing manual trip bar (TR-0N/3, TR-5-1N/3). A sequence inspection will be performed when the test button is pulled out. When the test button is pressed in, only the NC contact will turn OFF. The original status will be restored when the test button is then released. (TR-N2/3 to N8/3)

#### ● Trip-free mechanism

Even if the reset button is carelessly pressed, this relay trips without trouble (Trip-free mechanism).

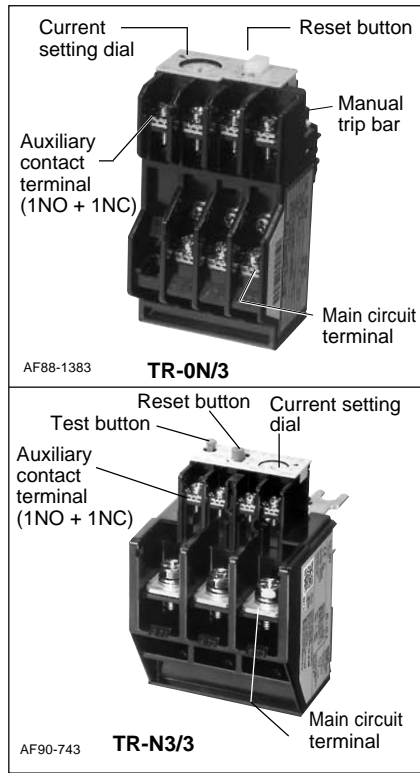
#### ● Easy visual checking of operating status

Trip indicator and manual trip bar permit visual check of tripping status.



#### ● Dial ampere setting

The setting dial uses a RC (Rated Current) marking which is set to the motor full load current.



### ■ Versatile optional accessories

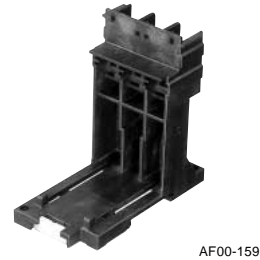
#### Trip indicator



#### Reset release



#### Base unit for separate mounting



### ■ Optional accessories

Description		Type	Ordering code	Used with thermal overload relay
Reset release	Lead length 300 mm	<b>SZ-R1</b>	TZ1R1	TR-0N/3, TR-5-1N/3, TK-0N, TK-5-1N
	500 mm	<b>SZ-R2</b>	TZ1R2	
	700 mm	<b>SZ-R3</b>	TZ1R3	TR-N10 to N14, TK-N10 to N14
You can reset these relays remotely on the front panels of switchboards.	Lead length 300 mm	<b>SZ-R4</b>	TZ2R4	TR-N2/3 to N8/3, TK-N2 to N8
	500 mm	<b>SZ-R5</b>	TZ2R5	
	700 mm	<b>SZ-R6</b>	TZ2R6	
Trip indicator	100–110V AC 50/60Hz	<b>SZ-L100</b>	TZ1L100	TR-0N/3, TR-5-1N/3, TK-0N, TK-5-1N
	200–220V AC 50/60Hz	<b>SZ-L200</b>	TZ1L200	TR-N10 to N14, TK-N10 to N14
Easier checking of trip status	100–110V AC 50/60Hz	<b>SZ-L100N2</b>	TZ2L100N2	TR-N2/3 to N8/3, TK-N2 to N8
	200–220V AC 50/60Hz	<b>SZ-L200N2</b>	TZ2L200N2	
Dial cover For protection against the current setting being changed in error		<b>SZ-DA</b>	SZ1DA	TR-0N/3, TR-5-1N/3, TK-0N, TK-5-1N TR-N2/3 to N14/3, TK-N2 to N14
Base unit for separate mounting The unit can be screw-mounted and rail-mounted.		<b>SZ-HB</b>	TZ1HB	TR-0N/3, TK-0N
		<b>SZ-HC</b>	TZ1HC	TR-5-1N/3, TK-5-1N
		<b>SZ-HD</b>	TZ2HD	TR-N2/3, TK-N2
		<b>SZ-HE</b>	TZ2HE	TR-N3/3, TK-N3
Terminal cover		<b>SZ-T10</b>	SZ1T10	Base unit for separate mounting SZ-HB
		<b>SZ-T11</b>	SZ1T11	Base unit for separate mounting SZ-HC
		<b>SZ-T14</b>	SZ2T14	For separate mounting TR-N2H/3, TK-N2H
		<b>SZ-T15</b>	SZ2T15	For separate mounting TR-N3H/3, TK-N3H
		<b>SZ-RN6T</b>	SZ2RN6T	For separate mounting TR-N6H/3, TK-N6H
		<b>SZ-T12</b>	TZ1T12	TR-0N/3, TK-0N
		<b>SZ-T13</b>	TZ1T13	TR-5-1N/3, TK-5-1N
		<b>SZ-T16</b>	SZ2T16	TR-N2/3, TK-N2
		<b>SZ-T17</b>	SZ2T17	TR-N3/3, TK-N2

■ Selection guide/Standard type

On-contactor mounting	3-element 2-element	TR-0N/3 (TR13DW) TR-0N (TR13NW)	TR-5-1N/3 (TR20DW) TR-5-1N (TR20NW)	TR-N2/3 (TR35BDW) TR-N2 (TR35BNW)	TR-N3/3 (TR65BDW) TR-N3 (TR65BNW)				
Separate mounting	3-element 2-element	TR-0NH/3 (TR13DH) TR-0NH (TR13NH)	TR-5-1NH/3 (TR20DH) TR-5-1NH (TR20NH)	TR-N2H/3 (TR35BDH) TR-N2H (TR35BNH)	TR-N3H/3 (TR65BDH) TR-N3H (TR65BNH)				
Contactor to be combined		SC-03	SC-0 SC-05	SC-4-0	SC-4-1 SC-5-1	SC-N1	SC-N2	SC-N2S	SC-N3
Ampere setting range (A)	Code	A	0.1 – 0.15	0.1 – 0.15	0.1 – 0.15	0.1 – 0.15			
		B	0.13 – 0.2	0.13 – 0.2	0.13 – 0.2	0.13 – 0.2			
		C	0.15 – 0.24	0.15 – 0.24	0.15 – 0.24	0.15 – 0.24			
		D	0.2 – 0.3	0.2 – 0.3	0.2 – 0.3	0.2 – 0.3			
		E	0.24 – 0.36	0.24 – 0.36	0.24 – 0.36	0.24 – 0.36			
		F	0.3 – 0.45	0.3 – 0.45	0.3 – 0.45	0.3 – 0.45			
		G	0.36 – 0.54	0.36 – 0.54	0.36 – 0.54	0.36 – 0.54			
		H	0.48 – 0.72	0.48 – 0.72	0.48 – 0.72	0.48 – 0.72			
		J	0.64 – 0.96	0.64 – 0.96	0.64 – 0.96	0.64 – 0.96			
		K	0.8 – 1.2	0.8 – 1.2	0.8 – 1.2	0.8 – 1.2			
		L	0.95 – 1.45	0.95 – 1.45	0.95 – 1.45	0.95 – 1.45			
		M	1.4 – 2.2	1.4 – 2.2	1.4 – 2.2	1.4 – 2.2			
		N	1.7 – 2.6	1.7 – 2.6	1.7 – 2.6	1.7 – 2.6			
		P	2.2 – 3.4	2.2 – 3.4	2.2 – 3.4	2.2 – 3.4			
		R	2.8 – 4.2	2.8 – 4.2	2.8 – 4.2	2.8 – 4.2			
		S	4 – 6	4 – 6	4 – 6	4 – 6	4 – 6	4 – 6	
		T	5 – 8	5 – 8	5 – 8	5 – 8	5 – 8	5 – 8	
		U	6 – 9	6 – 9	6 – 9	6 – 9	6 – 9	6 – 9	
		V	7 – 11	7 – 11	7 – 11	7 – 11	7 – 11	7 – 11	7 – 11
		W		9 – 13	9 – 13	9 – 13	9 – 13	9 – 13	9 – 13
		X			12 – 18	12 – 18	12 – 18	12 – 18	12 – 18
		Q				16 – 22			
		B					18 – 26	18 – 26	18 – 26
		E					24 – 36	24 – 36	24 – 36
		F						28 – 40	28 – 40
		I						32 – 42	
		G							34 – 50
		J							45 – 65
		O							48 – 68
		L							53 – 80*
		M							65 – 95*
		I							85 – 105*

On-contactor mounting	3-element 2-element	TR-N5/3 (TR80BDW) TR-N5 (TR80BNW)	TR-N6/3 (TR1CBDW) TR-N6 (TR1CBNW)	TR-N7/3 (TR1FBDW) TR-N7 (TR1FBNW)	TR-N8/3 (TR1JBDW) TR-N8 (TR1JBNW)	TR-N10/3 (TR2CBDW) TR-N10 (TR2CBNW)	TR-N12/3 (TR4ABDW) TR-N12 (TR4ABNW)	TR-N14/3 (TR8ABDW) TR-N14 (TR8ABNW)		
Separate mounting	3-element 2-element	– –	TR-N6H/3 (TR1CBDH) TR-N6H (TR1CBNH)	– –	– –	TR-N10H/3 (TR2CBDH) TR-N10H (TR2CBNH)	TR-N12H/3 (TR4ABDH) TR-N12H (TR4ABNH)	TR-N14H/3 (TR8ABDH) TR-N14H (TR8ABNH)		
Contactor to be combined		SC-N4	SC-N5A	SC-N6	SC-N7	SC-N8	SC-N10	SC-N11	SC-N12	SC-N14
Ampere setting range (A)	Code	B	18 – 26	18 – 26						
		E	24 – 36	24 – 36						
		F	28 – 40	28 – 40						
		G	34 – 50	34 – 50						
		J	45 – 65	45 – 65	45 – 65	45 – 65				
		L	53 – 80	53 – 80	53 – 80	53 – 80				
		M		65 – 95	65 – 95	65 – 95				
		I		85 – 105						
		N			85 – 125	85 – 125	85 – 125			
		P			110 – 160*	110 – 160	110 – 160	110 – 160	110 – 160	
		R					125 – 185	125 – 185	125 – 185	
		S					160 – 240	160 – 240	160 – 240	
		T						200 – 300	200 – 300	
		U							240 – 360	240 – 360
		V							300 – 450	300 – 450
		W								400 – 600

Notes: • TR-N10/3 to N14/3 types are provided with CTs.  
• Max. setting ranges of these starters are as shown in the table on the right.  
• When ordering the thermal overload relays for starter use, select the applicable setting range.  
( ): Basic ordering code (When ordering phase-loss protective type, enter the version code E instead of D)  
\*: Separate mounting only

Motor starter	Maximum applicable heater range (A)	
	200–240V	380–440V
SW-03/3H	7–11	6–9
SW-4-0/3H	12–18	12–18
SW-N1/3H	24–36	24–36
SW-N2S/3H	34–50	34–50
SW-N4/3H	53–80	53–80
SW-N6/3H	85–125	85–125

# Thermal Overload Relays

## TR series

### Long time operating type

#### ■ Selection guide/Long time operating type

On-contactor mounting	3-element	-		-		TR-N2L/3 (TR35BFW)		TR-N3L/3 (TR65BFW)	
	2-element	-		-		TR-N2L (TR35BLW)		TR-N3L (TR65BLW)	
Separate mounting	3-element	TR-0NLH/3 (TR13FH)		TR-5-1NLH/3 (TR20FH)		TR-N2LH/3 (TR35BFH)		TR-N3LH/3 (TR65BFH)	
	2-element	TR-0NLH (TR13LH)		TR-5-1NLH (TR20LH)		TR-N2LH (TR35BLH)		TR-N3LH (TR65BLH)	
Contactor to be combined		SC-03	SC-0 SC-05	SC-4-0	SC-4-1 SC-5-1	SC-N1	SC-N2	SC-N2S	SC-N3
Ampere setting range (A)	<b>Code</b>	<b>L</b>	0.95 – 1.45	0.95 – 1.45	0.95 – 1.45	0.95 – 1.45			
	<b>M</b>	1.4 – 2.2	1.4 – 2.2	1.4 – 2.2	1.4 – 2.2	1.4 – 2.2			
	<b>N</b>	1.7 – 2.6	1.7 – 2.6	1.7 – 2.6	1.7 – 2.6	1.7 – 2.6			
	<b>P</b>	2.2 – 3.4	2.2 – 3.4	2.2 – 3.4	2.2 – 3.4	2.2 – 3.4			
	<b>R</b>	2.8 – 4.2	2.8 – 4.2	2.8 – 4.2	2.8 – 4.2	2.8 – 4.2			
	<b>S</b>	4 – 6	4 – 6	4 – 6	4 – 6	4 – 6	4 – 6		
	<b>T</b>	5 – 8	5 – 8	5 – 8	5 – 8	5 – 8	5 – 8		
	<b>U</b>	6 – 9	6 – 9	6 – 9	6 – 9	6 – 9	6 – 9		
	<b>V</b>	7 – 11	7 – 11	7 – 11	7 – 11	7 – 11	7 – 11	7 – 11	7 – 11
	<b>W</b>		9 – 13	9 – 13	9 – 13	9 – 13	9 – 13	9 – 13	9 – 13
	<b>X</b>			12 – 18	12 – 18	12 – 18	12 – 18	12 – 18	12 – 18
	<b>B</b>					18 – 26	18 – 26	18 – 26	18 – 26
	<b>E</b>						24 – 36	24 – 36	24 – 36
<b>F</b>							28 – 40	28 – 40	
<b>G</b>							34 – 50	34 – 50	
<b>J</b>								45 – 65	
<b>L</b>								53 – 80*	
<b>M</b>								65 – 95*	

On-contactor mounting	3-element	TR-N5L/3 (TR80BFW)		TR-N6L/3 (TR1CBFW)	TR-N7L/3 (TR1FBFW)	TR-N10L/3 (TR2CBFW)		TR-N12L/3 (TR4ABFW)		TR-N14L/3 (TR8ABFW)	
	2-element	TR-N5L (TR80BLW)		TR-N6L (TR1CBLW)	TR-N7L (TR1FBLW)	TR-N10L (TR2CBLW)		TR-N12L (TR4ABLW)		TR-N14L (TR8ABLW)	
Separate mounting	3-element	-		TR-N6LH/3 (TR1CBFH)	-	TR-N10LH/3 (TR2CBFH)		TR-N12LH/3 (TR4ABFH)		TR-N14LH/3 (TR8ABFH)	
	2-element	-		TR-N6LH (TR1CBLH)	-	TR-N10LH (TR2CBLH)		TR-N12LH (TR4ABLH)		TR-N14LH (TR8ABLH)	
Contactor to be combined		SC-N4	SC-N5A	SC-N6	SC-N7	SC-N8	SC-N10	SC-N11	SC-N12	SC-N14	
Ampere setting range (A)	<b>Code</b>	<b>B</b>	18 – 26	18 – 26							
	<b>E</b>	24 – 36	24 – 36								
	<b>F</b>	28 – 40	28 – 40								
	<b>G</b>	34 – 50	34 – 50								
	<b>J</b>	45 – 65	45 – 65	45 – 65	45 – 65						
	<b>L</b>	53 – 80	53 – 80	53 – 80	53 – 80						
	<b>M</b>		65 – 95	65 – 95	65 – 95						
	<b>N</b>			85 – 125	85 – 125	85 – 125	85 – 125				
	<b>P</b>			110 – 160*	110 – 160	110 – 160	110 – 160	110 – 160	110 – 160	110 – 160	
	<b>R</b>					125 – 185	125 – 185	125 – 185	125 – 185	125 – 185	
	<b>S</b>						160 – 240	160 – 240	160 – 240	160 – 240	
	<b>T</b>							200 – 300	200 – 300	200 – 300	
	<b>U</b>								240 – 360	240 – 360	240 – 360
<b>V</b>								300 – 450	300 – 450	300 – 450	
<b>W</b>									400 – 600	400 – 600	

Notes: Maximum setting ranges of the these starters are as shown in the table below.

Select the applicable setting range when ordering the thermal overload relays for starter use.

( ): Basic ordering code

\*: Separate mounting only

Motor starter	Maximum applicable heater range (A)	
	200–240V	380–440V
SW-03/2L, 3L	7–11	6–9
SW-N2S/2L, 3L	34–50	34–50
SW-N4/2L, 3L	53–80	53–80
SW-N6/2L, 3L	85–125	85–125

■ Selection guide/Quick operating type

On-contactor mounting	3-element	TR-0NQ (TR13SW)		TR-5-1NQ (TR20SW)		TR-N2Q (TR35BSW)	
Separate mounting	3-element	-		-		-	
Contactor to be combined		SC-03	SC-0 SC-05	SC-4-0	SC-4-1 SC-5-1	SC-N1	SC-N2
Rated operational current (A)	200-240V 380-440V	11 9	13 12	18 16	22 22	27 30	39 37
Ampere setting range (A)	<b>Code</b>	<b>M</b>	1.4 - 2.2	1.4 - 2.2	1.4 - 2.2	1.4 - 2.2	
		<b>N</b>	1.7 - 2.6	1.7 - 2.6	1.7 - 2.6	1.7 - 2.6	
		<b>P</b>	2.2 - 3.4	2.2 - 3.4	2.2 - 3.4	2.2 - 3.4	
		<b>R</b>	2.8 - 4.2	2.8 - 4.2	2.8 - 4.2	2.8 - 4.2	
		<b>S</b>	4 - 6	4 - 6	4 - 6	4 - 6	
		<b>T</b>	5 - 8	5 - 8	5 - 8	5 - 8	
		<b>U</b>	6 - 9	6 - 9	6 - 9	6 - 9	
		<b>V</b>	7 - 11 *1	7 - 11 *1	7 - 11 *1	7 - 11 *1	
		<b>W</b>		9 - 13 *1	9 - 13 *1	9 - 13 *1	
		<b>X</b>			12 - 18 *1	12 - 18 *1	12 - 18
		<b>B</b>				18 - 26	18 - 26
		<b>E</b>					24 - 36

On-contactor mounting	3-element	TR-N3Q (TR65BSW)		TR-N5Q (TR80SW)	
Separate mounting	3-element	TR-N3Q (TR65BSW)		-	
Contactor to be combined		SC-N2S	SC-N3	SC-N4	SC-N5A
Rated operational current (A)	200-240V 380-440V	52 48	65 65	80 80	105 105
Ampere setting range (A)	<b>Code</b>	<b>B</b>	18-26	18-26	18-26
		<b>E</b>	24-36	24-36	24-36
		<b>F</b>	28-40	28-40	28-40
		<b>G</b>	34-50	34-50	34-50
		<b>J</b>		45-65	45-65
		<b>L</b>		53-80*2	53-80
		<b>M</b>		65-95*2	65-95

Notes: \*1 Thermal overload relay with phase-loss protection is available with \*1 marked setting ranges of TR-0NQ, TR-5-1NQ and all setting ranges of TR-N2Q to N5Q.  
Type numbers are TK-0NQ, TK-5-1NQ, TK-N2Q to N5Q. The setting ranges of these TK-□Q type relays are as same as those of the above setting ranges.  
\*2 Separate mounting only.  
( ) Basic ordering code

■ Ratings of auxiliary contact

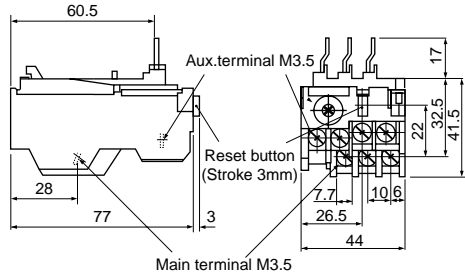
Type	Rated thermal current (A)	Rated voltage (V)	Rated AC operational current (A)	Rated DC operational current (A)
TR-0N, 5-1N TR-0N/3, 5-1N/3 TK-0N, 5-1N TR-0NQ, 5-1NQ	3	24 100-120 200-240 380-440 500-600	3 (0.3)* 2.5 (0.3)* 2 (0.3)* 1 (0.3)* 0.6 (0.3)*	1.1 (0.3)* 0.28 0.14 - -
TR-N2 to N8 TR-N2/3 to N8/3 TK-N2 to N8 TR-N2Q to N5Q	5	24 100-120 200-240 380-440 500-600	3 (0.5)* 2.5 (0.5)* 2 (0.5)* 1 (0.5)* 0.6 (0.5)*	1.1(0.3)* 0.28 0.14 - -
TR-N10 to N14 TR-N10/3 to N14/3 TK-N10 to N14	5	24 100-120 200-240 380-440 500-600	3 (0.3)* 2.5 (0.3)* 2 (0.3)* 1 (0.3)* 0.6 (0.3)*	1.1(0.3)* 0.28 0.14 - -

Notes: Conforming to Class AC-15, DC-13, IEC, JIS, and JEM.  
( ) \* NO contact of auto reset type.

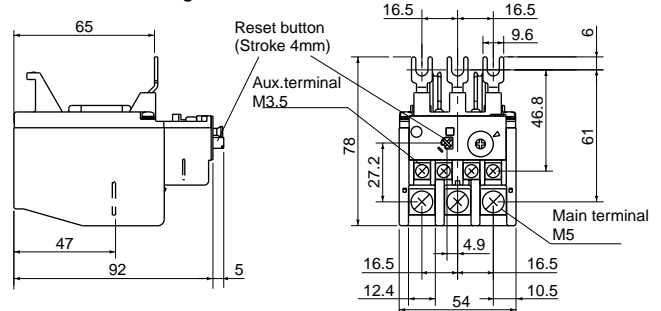
# Thermal Overload Relays

## TR series

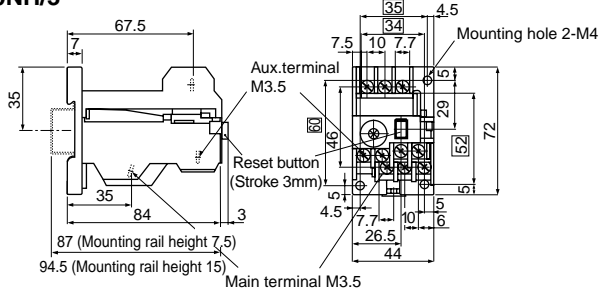
■ **Dimensions, mm**  
**Standard and quick operating types**  
**TR-0N/3, TR-0NQ**  
 On-contactor mounting



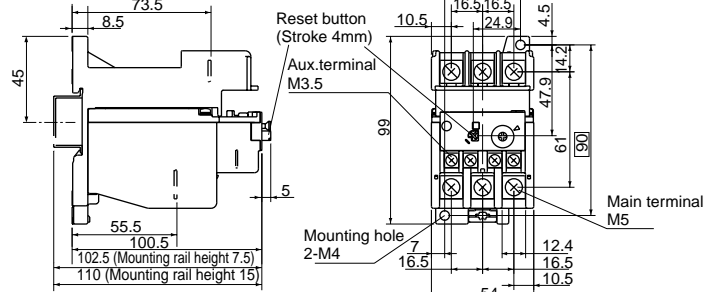
**TR-N2/3, TR-N2Q**  
 On-contactor mounting



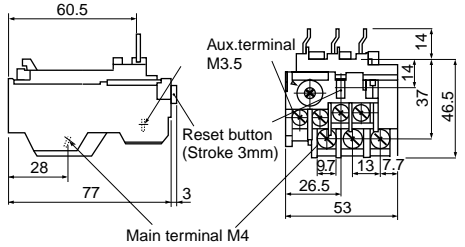
**TR-0NH/3**



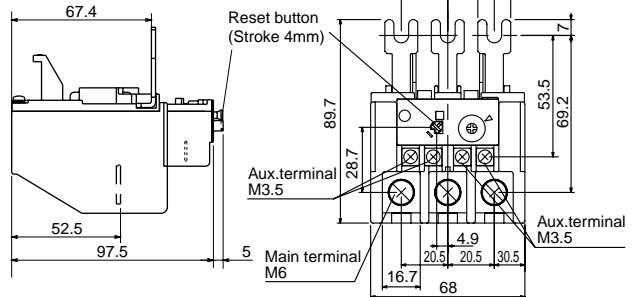
**TR-N2H/3**



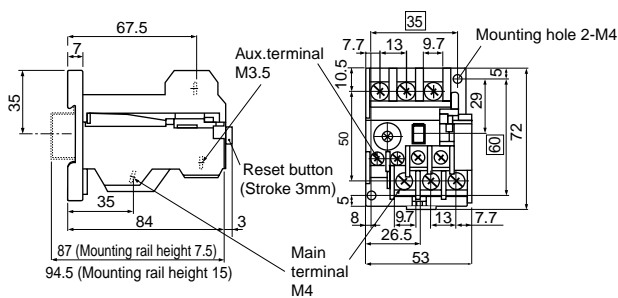
**TR-5-1N/3, TR-5-1NQ**  
 On-contactor mounting



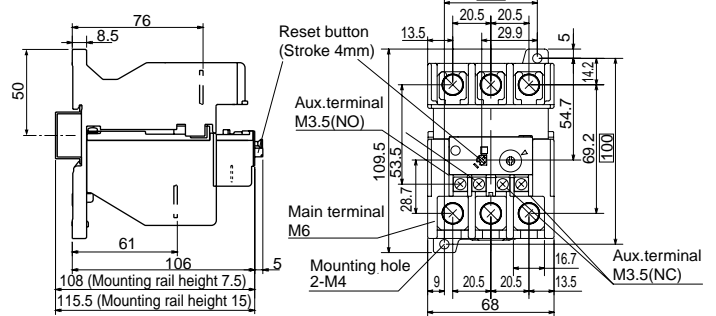
**TR-N3/3, TR-N3Q**  
 On-contactor mounting



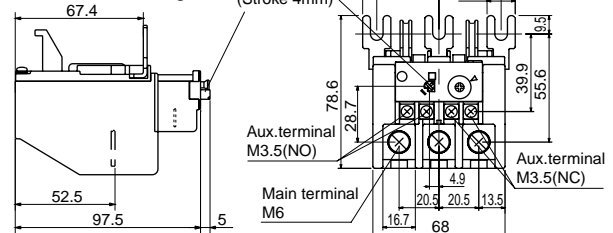
**TR-5-1NH/3**



**TR-N3H/3**



**TR-N5/3, TR-N5Q**  
 On-contactor mounting



□ : Mounting pitch  
 Mass: See page 01/96.